Space Weather Forecast

Issued on Thursday, 06 July 2023 at 13:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1/R2 Radio Blackouts. Minor to Moderate Geomagnetic Storms possible late 06 July or early 07 July with CME arrival.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate, with one Moderate flare observed, from either the large region just beyond the northwest limb, or the developing region in the northeast quadrant. There are eight sunspot regions on the disc in total, with a region in the south central disc and the region in the northeast quadrant rotating onto the southeast limb most likely to produce significant flare activity on the visible disc. A CME appears to have emanated from the southeast quadrant early on 06 July but no imagery is yet available to undertake a full analysis.

Solar Wind / Geomagnetic Activity: The solar wind as observed at L1, perhaps indicates the arrival of a weak, transient CME or a connection to a fast solar wind. Solar wind speeds increased from background to slightly elevated levels, with the magnetic field strength increasing from weak to moderate levels. The north-south component has varied weakly for much of the period, with a moderate perturbation towards the end of the period. Geomagnetic activity has been mostly Quiet to Unsettled.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Low to Moderate solar activity is forecast, with a chance of Moderate flares, but a decreasing risk of Strong flares from a region which has rotated off the solar disc. A number of newly evolving regions could present an increasing risk of activity through the period.

Solar Wind / Geomagnetic Activity: A CME which left the Sun 04 July is forecast to arrive at Earth either late on 06 July, or on 07 July, with elevated wind speeds. Otherwise solar wind speeds are forecast to increase to elevated or strong levels due to a connection to fast solar wind, although this connection could be masked by the CME arrival. Geomagnetic activity is forecast to increase from Quiet to Unsettled, to Active with a risk of G1/Minor or G2/Moderate storms either later on 06 July or on 07 July due to the possible CME arrival. This could be enhanced by the possible concurrent fast solar wind connection. Geomagnetic enhancements are then possible through the remainder of the period, but with a decreasing magnitude as speeds and magnetic effects wane.

Energetic Particles / Solar Radiation: Solar radiation has a slight but declining chance of reaching the S1/Minor Storm threshold through the period. The risk reduces as the large and complex sunspot continues to rotate away from the northwest limb on the far side.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	60	30	5
Strong	G3	No	5	10	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	30	30	30
Very Active	R3 to R5 X	No	10	5	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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